Tentarättningsmall: IOE011, 2015

1. a) Uppfinning blir innovation när den finner ett användningsområde/användare.
   b) Minskande marginalkostnad för högre q ($MC'(q)<0$).
   c) En vara med positiv priselasticitet inom ett visst intervall.
   d) Maximalt negativt ackumulerat kassaflöde i ett projekt (exempelvis ny produktinnovation). Uppstår innan positiva nettokassaflöden kommer, kopplade till projektet.
   e) (I en situation där många patent krävs för att kunna producera något, och där olika parter licensierar ut dessa.) När ett företag som borde betala för en patentlicens vägrar att göra det, men ändå fortsätter att använda det utan att betala.

2. a) Kommersiell framgång uppstår när en uppfinning finner ett användningsområde/användare. Ekonomisk framgång uppstår när en uppfinning lönar sig ekonomiskt (NPV>0). Ekonomisk framgång förutsätter att kommersiell framgång uppnåtts (kommersiell framgång föregår ekonomisk framgång).
   b) Anledning och hur supply respektive demand policies är designade (supply – för att minska (faktor-)kostnader etc.; demand – för att öka möjligheterna till framtida intäkter). Sambandet eller relationen, alltså övergripande varför policies som dessa förs in, samt vem eller vad som gör det.

3. 1) Falskt
   2) Falskt
   3) Sant
   4) Falskt
   5) Sant
   6) Sant
   7) Falskt
   8) Falskt
   9) Falskt

Q4) $p = -0{,}3q + 12000$

a) $p = -0{,}3q + 12000$

$q = \frac{12000 - p}{0{,}3} = 40000 - 3{,}33p$

$q'_p = -3{,}33$

$\pi = p \times q - MC \times q - FC$

$= -0{,}3q^2 + 12000q - 7000q - 0$

$\pi'_q = -0{,}6q + 5000 = 0$ $\quad \pi''_{qq} < 0$ MAX

$q = 8333$

$\Rightarrow p = \underline{\underline{9500}}$

b) $\pi(p = 9500) = (9500 - 7000) \times 8333 \approx 20{,}8 \cdot 10^6$

c) See course book

d) $\underline{\underline{\varepsilon = \frac{dq}{dp} \Big/ \frac{q}{p}}} = -3{,}33 \Big/ \frac{8333}{9500} \approx -3{,}80$

Om vi ökar priset med ca 1% så minskar efterfrågan med ca 3,8%.

e) Penetration pricing $\underbrace{\text{(pricing low in order to gain market share)}}$ could give me a quick growth, possibly leading to long ~~term~~ gains through lock-in effects (if any), ~~learning~~ learning curves, etc.

Skimming pricing would give me higher profit per customer and would also enable sale to a larger number of customers in total, by taking a price close to each customer's willingness to pay, down to the marginal cost.

f) Since there are constant returns to adoption the value of the product does not increase with an increasing installed base. In addition the customers can easily shift to a competitor once competition enters. Thus, it is better to go for market skimming pricing, giving larger returns in the short run, since the benefits of early growth might be difficult to appropriate. In addition, there is no learning curve in production.

g) Major process innovation requires a post-innovation monopolistic price lower than the pre-innovation competitive price / marginal cost. $(p_1 < MC_0)$

[minor is a smaller cost decrease]

$MC_0 = 7000$

$\cancel{\pi_1 = -0{,}5q^2 + 12000q}$

$$\pi = -aq^2 + bq - cq$$

$$\pi'_q = -2aq + b - c = 0 \qquad \pi''_{qq} < 0$$

$$q = \frac{b-c}{2a} \Rightarrow p = \frac{b+c}{2}$$

$$p_1 = \frac{b + (7000 - 0{,}0001R)}{2}$$

$$= \frac{12000 + 7000 - 0{,}0001R}{2} = 9500 - 0{,}00005R$$

$$p_1 < MC_0 \Rightarrow 9500 - 0{,}00005R < 7000$$

$$2500 < 0{,}00005R$$

$$\underline{50\,000\,000 < R}$$

At least 50 million

h) g)

$$MC_1 = 7000 - 0{,}0001 \times 50 \times 10^6 = 2000$$

$$P_1 = \frac{12000 + 2000}{2} = 7000 \Rightarrow q = 16700$$

$$\pi_1 = (7000 - 2000) \times 16700 = 83{,}5 \times 10^6$$

$$\Delta\pi = \pi_1 - \pi_0 = (83{,}5 - 20{,}8) \times 10^6 = 62{,}7 \times 10^6 > 50 \times 10^6$$

$\Downarrow$

YES!

i) See g)

Gives $$\hat{\pi} = -a\left(\frac{b-c}{2a}\right)^2 + b\left(\frac{b-c}{2a}\right) - c\left(\frac{b-c}{2a}\right) =$$

$$= \frac{(b-c)^2}{4a}$$

constant

$$V(R) = \hat{\pi}_1(R) - \hat{\pi}_0 - R$$

$$V'(R) = \hat{\pi}_1'(R) - 1 = 0$$

$$\hat{\pi}_1(R) = \frac{(12000 + 0{,}5\sqrt{R} - 7000)^2}{4 \times 0{,}3} = \frac{(5000 + 0{,}5\sqrt{R})^2}{1{,}2} =$$

$$= 20{,}8 \times 10^6 + 4170\sqrt{R} + 0{,}208R$$

$$\pi_1'(R) = \frac{2085}{\sqrt{R}} + 0{,}208$$

$$V'(R) = \frac{2085}{\sqrt{R}} + 0{,}208 - 1 = 0 \qquad \left[\underset{MAX}{V''(R) < 0}\right]$$

$$\frac{2085}{\sqrt{R}} = 0{,}792$$

$$\sqrt{R} = \frac{2085}{0{,}792} \Rightarrow \underline{6{,}93 \times 10^6} = R$$

$\rightarrow$

Value?

$$b_1 = 12000 + 0{,}5\sqrt{6930000} = \cancel{14630}\ \cancel{\text{[illegible]}}\quad 13\,300$$

$$\hat{\pi}_1 = \frac{(b-c)^2}{4a} = \cancel{48{,}5 \times 10^6}\quad 33{,}2 \times 10^6$$

$$V = \Delta\hat{\pi} - R = (\overset{33{,}2}{\cancel{48{,}5}} - 20{,}8 - 6{,}93) \times 10^6 = \underline{\underline{\overset{5{,}47 \times 10^6}{\cancel{20{,}8 \times 10^6}}}}$$

IVE Oct 2015

Q5a) See course literature (and slides)

b) Dissociation of purchasing roles (example):

Customer: probably Adam or mother
Buyer: mother
User: Adam
Decision influencer: probably friends

There are probably positive network externalities

c) See pp. 216-217

Good and reasonable motivations for the ones you select are needed.

Early: Larger chance to get patent.
Late: Longer protection time.
} Since TTM is short, the benefit with late is small, so I would go for early.

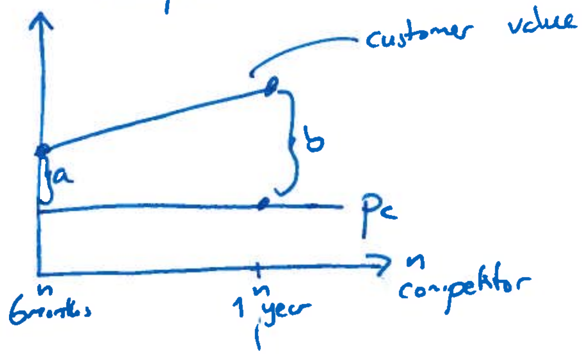
d) See attached

e) I don't agree, the initial \$30 M is a sunk cost and should not be included in our current investment evaluation.

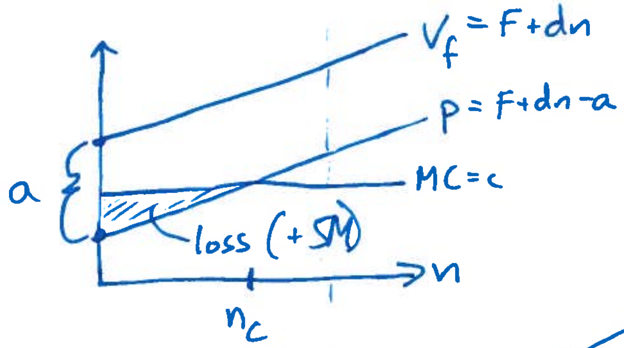
f) Logistic model, see pp. 189-191

d)

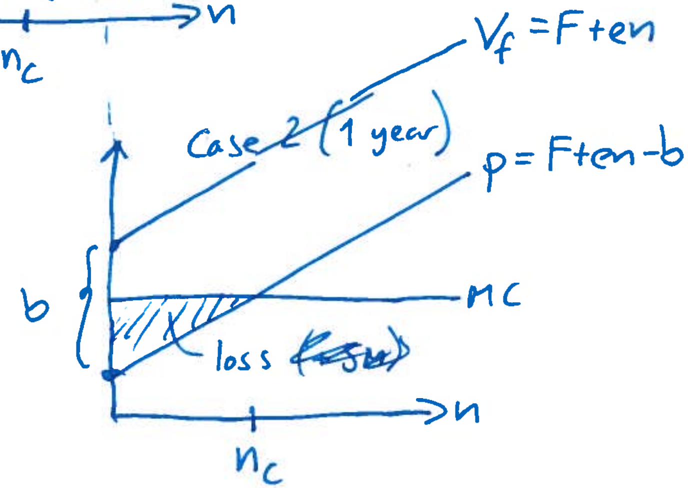
Competitor:




Case 1 (6 months):




$e > d$




[Qualitative reasoning with the same argument is also ok!]

**Loss in case 1:**

$c = F + dn_c - a \Rightarrow n_c = \frac{c+a-F}{d}$

$$\text{Loss} = SM + \frac{(c-(F-a)) \times \left(\frac{c+a-F}{d}\right)}{2} = \frac{(c+a-F)^2}{2d} + SM$$

**Loss in case 2:**

$c = F + en_c - b \Rightarrow n_c = \frac{c+b-F}{e}$

$$\text{Loss} = \frac{(c-(F-b)) \times \left(\frac{c+b-F}{e}\right)}{2} = \frac{(c+b-F)^2}{2e}$$

**Conclusion**

Speed things up iff

$$\frac{(c+a-F)^2}{2d} + SM < \frac{(c+b-F)^2}{2e}$$

Thus depends on our (increase in) customer value $(F, e, d)$ as well as our competitor's $(a, b)$.